Consensus dynamics in distribution networks and nonlinear multi-agent systems

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Propositions to accompany the dissertation

Consensus Dynamics in Distribution Networks and Nonlinear Multi-Agent Systems

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1. The connection between the stability of dynamical distribution networks and static network optimization problems is provided by the interior point condition. (Chapter 3, Section 3.5)

2. The stability of dynamical distribution networks is depending on the flow constraints, the topology of underlying graph and the values of the inflows and outflows. (Chapter 3)

3. The consensus protocol with arbitrary sign-preserving nonlinearities may give rise to the unwanted behavior of 'sliding consensus', where the consensus value is an arbitrary function of time. (Chapters 4,5)

4. A consensus point of a consensus protocol is stable only if the Filippov set-valued map at this point intersects non-trivially with the consensus space at the origin only. (Chapter 5)

5. In case of consensus protocols on directed graphs, the steady state corresponding to an initial state is uniquely determined by the dynamics of the agents at the roots of the graph. (Chapter 5)

6. Chi Wan thought thrice, and then acted. When Confucius was informed of it, he said, "Twice may do." (Confucian Analects)

7. True warriors bravely face crying babies.